

Claims

What is claimed is:

- [c1] A method for forming a drill bit body, comprising:
infiltrating powdered tungsten carbide with a binder alloy in a mold, the mold having therein at least one displacement adapted to form a mounting pad for a cutting element, the displacement comprising a substantially cylindrical body having a diameter selected to substantially conform to a radius of the cutting element and a projection adapted to form a relief groove under a position of a diamond table in the cutting element when the cutting element is mounted on the pad, a width of the relief groove selected so that the relief groove extends back from an outer surface of the bit body at least about 40 percent of that portion of a thickness of the diamond table which does not extend past the outer surface.
- [c2] The method as defined in claim 1 wherein the cutting element comprises a tungsten carbide substrate, the substrate brazed to the mounting pad.
- [c3] The method as defined in claim 1 wherein the at least one displacement comprises a castable material formed into a single body.
- [c4] The method as defined in claim 1 wherein the projection extends past an external surface of the displacement by about 0.025 inches.
- [c5] A drill bit body comprising:
a main body having at least one blade formed therein; and
at least one cutting element mounting pad formed on the at least one blade, the mounting pad adapted to receive therein a substrate of a cutting element, the mounting pad having a relief groove therein under a position of a

diamond table in the cutting element when the cutting element is mounted on the pad, a width of the relief groove selected so that the relief groove extends back from an outer surface of the blade at least about 40 percent of that portion of a thickness of the diamond table which does not extend past the outer surface,

wherein the at least one cutting is substantially flush with the outer surface of a mounting position on the bit body.

[c6] The drill bit body as defined in claim 5, wherein the bit body is formed from powdered tungsten carbide infiltrated by a binder alloy.

[c7] The drill bit body as defined in claim 5 wherein the relief groove has a depth of 0.025 inches.

[c8] A drill bit comprising:

a bit body having a plurality of blades formed therein; and

a plurality of cutting elements mounted on each of the blades, each cutting element mounted on a cutting element mounting pad formed on one of the blades, the mounting pad adapted to receive therein a substrate of the cutting element, the mounting pad having a relief groove therein under a position of a diamond table in the cutting element when the cutting element is mounted on the pad, a width of the relief groove selected so that the relief groove extends back from an outer surface of the blade at least about 40 percent of that portion of a thickness of the diamond table which does not extend past the outer surface,

wherein the at least one cutting is substantially flush with the outer surface of a mounting position on the bit body.

[c9] The drill bit as defined in claim 8 wherein the bit body comprises powdered tungsten carbide infiltrated with a binder alloy.

[c10] The drill bit as defined in claim 8 wherein each of the relief grooves has a depth of about 0.025 inches.

[c11] A drill bit body comprising:

a main body having at least one blade formed therein; and

at least one cutting element mounting pad formed on the at least one blade, the mounting pad adapted to receive therein a substrate of a cutting element, the mounting pad having a relief groove therein under a position of a diamond table in the cutting element when the cutting element is mounted on the pad, the drill bit body formed by machining a bit body blank,

wherein the at least one cutting is substantially flush with the outer surface of a mounting position on the bit body.

[c12] A method for forming a drill bit body, comprising:

infiltrating powdered tungsten carbide with a binder alloy in a mold, the mold having therein at least one displacement adapted to form a mounting pad for a cutting element, the displacement being made from a single component comprising a substantially cylindrical body having a diameter selected to substantially conform to a radius of the cutting element and a projection adapted to form a relief groove under a position of a diamond table in the cutting element when the cutting element is mounted on the pad.

[c13] The method as defined in claim 5 wherein the relief groove has a depth of about 0.025 inches.

[c14] The method as defined in claim 5 wherein the relief groove extends back from an outer surface of the blade at least about 40 percent of that portion of a thickness of the diamond table which does not extend past the outer surface.